

CHRISTOFFERSON ENGINEERING

July 12, 2005

Dr. Howard B. Bernstein
RPS Program Manager
Massachusetts Department of Energy Resources
100 Cambridge St. Suite 1020
Boston, Massachusetts 02114

Dear Dr. Bernstein;

I am writing you to make comment on your recent proposed changes to the RPS standards. In general, I applaud your changes to provide greater definition and objectiveness to your standards. As a consultant to biomass energy plant developers and owners, it will greatly facilitate development of new or improved biomass plant. Definition, as long as it is financially achievable is always desirable. The financial community abhors uncertainty. As a legislator, specificity in rules will always assist in determining whether the rules are in accordance with legislative intent (I dislike vague law). I will make specific comments under the headings you used below.

- A. Stokers have undergone a continuous level of improvement over the last 20 yrs: Detroit has developed the Hydrograte which uses the grate in the steam cycle, fuel feeders have been constantly upgraded to improve distribution accross the grate and improve burnout. Cinder re-injection has been added to reduce unburned carbon in the ash. Overfire Air has been improved to reduce CO and VOC emissions.
- B. The heat rate should be specified to be at sea level, ASME standard conditions and design fuel(s). To do otherwise would give a plant in Bridgewater and inherent advantage over a plant in Fitchburg, which may not be where the fuel is. In order to ensure uniformity, I would use ASME Code 4.1 to determine heat rate. The ASME code compensates for off design conditions including fuel quality, ambient conditions and altitude.
- C. Generally speaking the emissions in Table 2 are representative of current state-of-the-art. The future limits in Table 3 may be too aggressive. For example, the combination of reducing both NO_x and NH_3 may not be possible. SCR systems that reduce NO_x emissions further will have a greater tendency for NH_3 emissions. CO emissions of 0.01 lb/MMBtu may be very difficult to achieve currently oxidation catalyst vendors are only willing to guarantee 50% reduction, and that was difficult to obtain and South Point Power. It must also be recognized that biomass has higher concentrations of Ca, K and Na, than most coals which are the primary catalyst poisons.

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- D. Output based emissions are probably a better mechanism. Heat rate is controlled largely by cycle characteristics. The current level of heat rate is controlled by the steam throughput which limits the pressures which can be used while maintaining acceptable turbine dimensions and velocities. Bubbling and circulating fluidized beds do pay a penalty for their fan power, but might have lower uncontrolled emissions, making achieving lower emissions less costly. However, if it is not less costly to achieve the specified output based emission levels, then I supposed they are not really more advanced than stoker units. The only step change in output based emissions is in combined cycle units arising out of gasification and combined heat and power if you can determine an equitable method of accounting for the heat.
- E. Yes, I think the two year lead time is reasonable.
- F. I do not think that the separation between the new and existing is as great as perceived. If the incentives are not available for upgrading, the result will be new units at the expense of existing units. This will result in a lot of wasted capital. One has to realize that the economic viability of biomass is marginal. In many cases, the lack of PURPA or RECs is the difference between profit and loss. It is not just an issue competitive advantage, but of existence for some facilities. New Hampshire has seen the closure and removal of a number of biomass facilities after their PURPA contracts expired. Unfortunately, I do not have economic specifics, but I believe that 3 yr is too short, one of my customers elected not to opt in to NO_x credits because the 5 yr life of the credits did not justify entering the system. I think 5 to 10 yrs is more appropriate existing units and 10 to 20 yrs is more appropriate for a new unit. Remember, new units are typically financed over 20 yrs. If the profitability of a plant disappears half way through the life of the project what is the likely result of an economic analysis. For a plant that is easily converted to other fuels such as a CFB, if the credit disappears, so likely will the biomass, to be replaced by coal. That does not achieve the objective of the program.
- G. Yes, I agree with the time limits as a mechanism to ensure that approved projects are indeed going forward. However, the qualifications for extension should be minimal, and based upon continued investment in the project. I have been working on the South Point Power project since Dec. of 1997. It is large enough that it does not depend upon RECs or other price supports for viability (though they are being sought). Due to changes in design, through put and manufacturer's guarantees it is now just getting ready to go in to construction.

H. No.

Sincerely,

Hon. Daniel C. Itse, P.E.
President

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